

Studying Urban Space and Literary Representations Using GIS

Lisbon, Portugal, 1852–2009

This article proposes a methodology to address the urban evolutionary process, demonstrating how it is reflected in literature. It focuses on “literary space,” presented as a territory defined by the period setting or as evoked by the characters, which can be georeferenced and drawn on a map. It identifies the different locations of literary space in relation to urban development and the economic, political, and social context of the city. We suggest a new approach for mapping a relatively comprehensive body of literature by combining literary criticism, urban history, and geographic information systems (GIS). The home-range concept, used in animal ecology, has been adapted to reveal the size and location of literary space. This interdisciplinary methodology is applied in a case study to nineteenth- and twentieth-century novels involving the city of Lisbon. The developing concepts of cumulative literary space and common literary space introduce size calculations in addition to location and structure, previously developed by other researchers. Sequential and overlapping analyses of literary space throughout time has the advantage of presenting comparable and repeatable results for other researchers using a different body of literary works or studying another city. Results show how city changes shaped perceptions of the urban space as it was lived and experienced. A small core area, correspondent to a part of the city center, persists as literary space in all the novels analyzed. Furthermore, the literary space does not match the urban evolution. There is a time lag for embedding new urbanized areas in the imagined literary scenario.

Following Henri Lefèbvre's (1991: 42) idea that a true history of space should include "also the history of representations," since the 1970s historians have argued for the full integration of space in historical analysis. Since the late 1990s, in an interdisciplinary movement, researchers have sought to explore "subjective geographies through the spatial representation of qualitative, or fuzzy, data" (Cooper and Gregory 2011: 89). Given this framework and by engaging space as a "complex social formation" (Ayers 2010: 1), this article incorporates a cultural and temporal dimension in its approach to the literary representations of urban space, understood as a joint construct of the author's social experience, daily life, and imagination.

From Maurice Blanchot's concept to the semiotic approach (by Yuri Lotman and his followers), space has been a multiperspective topic in literary studies. In this complex context, Ernest W. B. Hess-Lüttich (2012) discusses the consequence of "spatial turn" to this research field, organizing previous works in four perspectives: phenomenological (space as a product of human perception, which allows for conclusions concerning respective effective social standards and cultural values), cartographic (space resulting from nameable relations of reference between inner- and outer-literary reality), topographic (space as imaginary geography, the constitutive character of social practice), and topological (space as a sign system filled with meaning on which social reality is constituted).

Herein the "literary space" is presented as a territory defined by the period setting or as evoked by the characters, which can be georeferenced and drawn on a map. This definition resembles and operationalizes the concept of story space as a category of narrative space: "the space relevant to the plot, as mapped by the actions and thoughts of the characters" (Ryan 2012: 11). The literary space is made up from the space-time matrix called "chronotope" by the Russian philosopher and philologist M. M. Bakhtin in the 1920s and explained more recently in the following manner: "In different kinds of writing there are differing chronotopes, by which changing historical conceptions of time and space are realized" (Dentith 2001). In its relationship with the territory, it is a topographic structure, "a kind of map based on elements from the entire text, including all its components" (Zoran 1984: 316).

The literary space is not an overlay of the urban space. The city neither is nor was exactly what the writers have told us. In fact their work reflects a set of preconceptions, common knowledge, and experiences (including their

own), reproducing and reinventing landscapes. Nevertheless, the literary representations create an illusion of knowledge and identity with the territories referenced. The readers share the description of these spaces and mentally assimilate the geography. This relationship is separate from the described realism: once a vision is created, the metaphors become more real than their referents and become part of the scenarios (Schara 1995: 60–61).

The framework of the relationship between referent and representation is marked by a spatiotemporal view that itself reveals an interest in literature as a source for history and geography. Historically distinct literary representations become relevant in observing how its inhabitants, rulers, visitors, or distant observers superimpose themselves over the space.

This is a classic issue addressed by Francisco Fuster García (2011) and by Ana Isabel Queiroz and Daniel Alves (2012), among others. The notion of “literary space” becomes relevant for historians and geographers by combining (1) an objective dimension that can be used as a source of information about the urban landscape and (2) a subjective dimension in which the writer’s values and choices reflect the thinking of the time period. Furthermore, Brian S. Osborne (1996: 29) states: “Their creative imaginations often serve as powerful expositions of peoples, settings, and events. And they write with the greatest authority and insight about the worlds with which they are most familiar.”

The concept of literary space is also part of a dynamic process that encompasses the authors’ individual choices and perspectives as well as the historical depiction of the moment (or the one to which the authors refer). Using the historical moment as a variable of analysis enables us to discern spatial perspectives, giving them consistency or noting their divergences.

Trying to conciliate the four perspectives identified by Hess-Lüttich (2012), this article identifies the shifting locations and boundaries of literary space relative to urban development and the socioeconomic and political context of Lisbon and novels depicting Lisbon from the mid-nineteenth century to the present as a case study. Applying a new methodology, it generates georeferenced maps of points, spots, and polygons correspondent to location, structure, and dimension of literary space. By comparing them to other cartographic representations of contemporary historical records and sources, we can discuss how features of the urban evolution reverberate in literary works and how an integrated analysis of those works, taking into account criticism, geography, and history, can contribute to social, urban, and literary history.

This case study of literary space benefited from a methodological approach that included the quantitative analysis of literary geographies and their integration with historical sources, reconciling a subjective and an objective reading of the urban space. This article attempts to reconcile two complementary methods used in the new humanities, as argued by Jonathan Gottschall (2008): the traditional qualitative analysis (by careful reading and reasoning) and the quantitative approach seeking to limit the scope for various forms of bias (subjectivity, selection, and so on) and seeing patterns in large populations of literary works.

This study diachronically confronts Lisbon's literary space with documented description, locating and quantifying the terrain evoked by the writers and the historical evolution of the city as a frame of reference. Existing research is embedded in the framework of literary history (Moretti 1998) and geocriticism (Westphal 2007) but does not strive to deal with the meaning and role of certain places used by writers in their creative activity—a well-debated topic in comparative literature studies. Backed by the analysis of the geographic content of the text and bolstered by the growing use of geographic information systems (GIS), noteworthy research has examined “literary cartography” (Tally 2008a, 2008b) and “literary geography” (Piatti, Bär, et al. 2009; Piatti, Reuschel, et al. 2009). The potential of GIS as an analytic tool in historical research is widely recognized for its capacity to join time with geographic characteristics (Goodchild 2002; Knowles 2005; Langran 1992). Undoubtedly, the field of study where most progress has been made toward this goal is urban history (DeBats and Gregory 2011).

Therefore we propose a new approach for mapping a fairly comprehensive body of literature. By highlighting literary criticism, using GIS, and wielding historical knowledge about the notion of the space under analysis, we aim to create an interdisciplinary methodology that goes beyond geographic pattern displays or comparative literature. This approach identifies spatial concentrations and peripheral locations in the cultural history of the region, sifting out how they evolved over time in an analytic perspective similar to “literary GIS” (Cooper and Gregory 2011: 90) but, in this case, applied to urban space as a way to study its social and cultural transformation or appropriation.

The Study Area: Literary Imagination, Urban Development, and GIS

Like New York, London, Dublin, Paris, and many other urban cosmos, Lisbon is a literary city. In the last two centuries it has been described in stories, novels, diaries, reports, essays, and chronicles. This capital city attracted universally recognized writers, both national and foreign. Thus Lisbon glows on the map of literary cities (Rolin 2001: 28). A fertile imagination accompanied Lisbon's population growth and urban sprawl as well as the profound social and political changes it experienced from the nineteenth century to the present.

Over the last two centuries Lisbon has registered significant growth and has undergone a process of administrative reconfiguration resulting from demographic and urban development. After the earthquake in 1755, there was a need to implement new urban reform, and the capital's municipal boundaries underwent some changes when the lines dividing the parishes were redrawn. In 1852, in 1885–86, and in 1959 the city's layout was reorganized to accommodate a growing population and housing construction.

In the first half of the nineteenth century, the municipality of Lisbon enclosed about 533 square kilometers, making it far larger than its urban area, which includes only a tract along the Tagus River (Alves 2005). Among other factors, this riverside configuration was related to the physical nature of the terrain, characterized by several hills that rise in the landscape from the river's edge (figure 1). Until this period the city had not "turned its back on the river, on the contrary it had followed along with it as much as possible" (Marques 2003: 24). By the mid-nineteenth century Lisbon's urban space had come to match that of Lisbon the municipality, which the administrative division reduced to an area of roughly 14 square kilometers. The city lost all its rural parishes to the north and part of the riverside to the east and west of the central core. This configuration lasted until 1885–86, when the territory was expanded to 84.6 square kilometers, reaching the municipality's current boundaries (Alves 2005).

The study area corresponds to the municipality of Lisbon. Three rings were defined to systematize and simplify the presentation of the geographic image and temporal evolution of the city (figure 1). The first ring corresponds to the city's territory between 1852 and 1886, later called "the nineteenth-century city," with diverse implantations of urban housing: one a zone of medieval origin, another a consequence of the earthquake (the city core), and



Figure 1 The study area: Lisbon's city core, main boulevards, and rings of urban development

another a result of strong population growth in the last decades of the century. The second ring corresponds to the urban and demographic growth of Lisbon in the first half of the twentieth century: the northern boundary is defined by a group of highways that served as a boundary for the northern parishes in the administrative reform of 1959. The third ring, predominantly a rural area until the 1950s, thereafter became the area of the city with the largest demographic and urban growth and the only area that maintained a positive variation of population between 1960 and 1981 (Alves 2005; Brito et al. 1986). A similar descriptive approach was used previously in studies about Lisbon's urban evolution in the nineteenth and twentieth centuries (e.g., Calado 1993: 42; Ferreira 1987: 95, 100).

Literary Corpus and Historical Framework

This article analyzes the literary space from a selection of 35 novels published between 1854 and 2009 by 30 writers, among them some of the most

famous in Portuguese literature (table 1). The selection was guided by Lúcia Liba Mucznik's (1995) book on writings predating her work. The novels have in common Lisbon as the main setting, described in the period between 1854 and 2009. The fact that the authors had lived or visited Lisbon in the time period depicted in their novels was a central criterion for inclusion.

Place-names and locales (e.g., theaters, cafés, public institutions) mentioned in the texts were identified and recorded in a GIS database. Lisbon's municipal place-name database, street guides from the second half of the nineteenth century, and historical cartography from the first half of the twentieth century (Alves 2005) were used to identify locations. It was not possible to georeference about 10 percent of the locations in the novels (most likely imaginary or antiquated designations), because they matched no current place-name.

Analyzing the evolution of the location and dimension of the literary space, the data from each novel were treated according to the historical time referenced in the narrative action and were associated with four historical and political periods. *First period (1852–1910; monarchy)*: Taking advantage of economic development, the city registers strong population growth and urban renewal, associated with some innovations in transportation, and seeks to ensure the status of a modern European capital by implementing the urban planning project of Ressano Garcia in the 1870s and 1880s (Ferreira 1987; Silva 1989). This is the city of small shops and republican agitation (Alves 2012) that faces “the strange death of the [Portuguese] Monarchy” (Ramos 1994: 335). *Second period (1910–26; republic)*: After the October 5 revolution in 1910, Lisbon becomes the “Marianne” of the First Republic. It is stirred by strikes and political struggles, by the crisis of the Great War, and by pneumonic influenza in 1918. Population growth and urban development, however, are uninterrupted, with visibly different rhythms between the center (slower) and the periphery (faster) (Ramos 1994). *Third period (1926–74; dictatorship)*: Until World War II the dictatorial regime Estado Novo seeks to make Lisbon the capital of the empire by implementing an urban development plan and erecting emblematic works. After 1945 population growth, housing construction, and real estate speculation also transform the city, which experiences an increase in the predominance of the service industry. From 1960 the capital solidifies its tertiary sector and begins to lose demographic momentum (Ferreira 1987). *Fourth period (1974 to present; democracy)*: Lisbon is stirred by the April 25 revolution in 1974, experiencing

Table 1 List of novels by time period

Time period	Title	Writer	First edition
1st	<i>A Capital!</i>	Eça de Queirós	1929
1st	<i>A Cidade do Vício</i>	Fialho de Almeida	1882
1st	<i>A Escola do Paraíso</i>	José Rodrigues Miguéis	1960
1st	<i>A Queda dum Anjo</i>	Camilo Castelo Branco	1865
1st	<i>Alves e C.^a</i>	Eça de Queirós	1925
1st	<i>Coisas Espantosas</i>	Camilo Castelo Branco	1862
1st	<i>Filho das Hervas</i>	Carlos Malheiro Dias	1900
1st	<i>Lisboa em Camisa</i>	Gervásio Lobato	1915
1st	<i>Mistérios de Lisboa</i>	Camilo Castelo Branco	1854
1st	<i>O Livro de Alda</i>	Abel Botelho	1898
1st	<i>Os Maias</i>	Eça de Queirós	1888
1st	<i>Tuberculose Social</i>	Alfredo Gallis	1903
2nd	<i>A cidade-formiga</i>	Mário de Almeida	1918
2nd	<i>As Criminosas do Chiado</i>	João Ameal	1925
2nd	<i>Lisboa sem Camisa. Vol. 1, O casamento da Fifi Antunes</i>	Armando Ferreira	1934
2nd	<i>O Arcanjo Negro</i>	Aquilino Ribeiro	1947
2nd	<i>O Milagre segundo Salomé</i>	José Rodrigues Miguéis	1975
3rd	<i>A Noite e o Riso</i>	Nuno Bragança	1970
3rd	<i>A Raiz e o Vento</i>	Leão Penedo	1953
3rd	<i>Angústia para o Jantar</i>	Luís de Sttau Monteiro	1961
3rd	<i>Cão Velho entre Flores</i>	Armando Baptista-Bastos	1974
3rd	<i>Começa uma vida</i>	Irene Lisboa	1940
3rd	<i>Crónica dos bons malandros</i>	Mário Zambujal	1980
3rd	<i>Ela é apenas mulher</i>	Maria Archer	1944
3rd	<i>Enseada Amena</i>	Augusto Abelaira	1965
3rd	<i>Fado da Mouraria</i>	Norberto de Araújo	1931
3rd	<i>O Rio Triste</i>	Fernando Namora	1982
4th	<i>Alexandra Alpha</i>	José Cardoso Pires	1987
4th	<i>As Naus</i>	António Lobo Antunes	1988
4th	<i>Deixem passar o Homem Invisível</i>	Rui Cardoso Martins	2009
4th	<i>Era bom que trocássemos umas ideias sobre o assunto</i>	Mário de Carvalho	1995
4th	<i>Fora de Mim</i>	Manuel Halpern	2008
4th	<i>Hotel Lusitano</i>	Rui Zink	1986
4th	<i>Morte em Campo de Ourique</i>	Orlando Neves	1987
4th	<i>Notícia da Cidade Silvestre</i>	Lídia Jorge	1984

freedom and democracy. Previous trends, such as the growth of the service industry, gain strength, but the historical center becomes vacant, and peripheral residential areas begin to expand. From 1981 onward all of Lisbon's parishes lose population, and socioeconomic and cultural urban experiences consolidate outside the old city core (Ferreira 1987).

This study does not intend to analyze the significance of every location mentioned (or study place making across time), so repetitions in each novel, and in the four subsamples (one by time period), were not accounted for.

Methodology for Spatiotemporal Analysis

The analysis of the 35 novels across space and time results in a historical reading of the specific times they depict. Accordingly, a relational database links literary excerpts and the places mentioned therein to corresponding geographic coordinates via direct import into GIS. The system also records an entire semantic interpretation and classification of the different extracts, allowing for an analysis of their significance and deeper characterizations of the meaning of each place, potentials not explored in this article. This analytic tool was developed under an interdisciplinary research project on Portuguese literary landscapes that has been running since 2010 (see Queiroz 2011).

The location coordinates were introduced into the database using the Google Maps World Gazetteer, extracting the exact locations of buildings or places identified or the midpoint when only streets or areas of the city are referred to in the texts. The latitudes and longitudes of the locations were then imported into ArcGIS 10, creating shapefiles with three groups of primary data: (1) all locations of all literary works, (2) the locations for each of the four chronological periods, and (3) the locations for each of the 35 selected works. The literary space was analyzed in these three data assemblies on the basis of quantitative and spatial analysis methodologies.

The relationship between space and time was first analyzed using maps of points (one by each different place mentioned) developed for each group of novels of each specific historical period. To evaluate the hypothesis of independence, a chi-square test was applied to the number of places mentioned by rings for each period.

When studying and comparing the spatial distribution of locations and its evolution over time, the average nearest neighborhood (ANN) (Ebdon

1985: 128–70) was calculated. This measure seeks to understand if the same places mentioned in several works in each period are random occurrences or if there was a focus on specific areas resulting from a preference by several authors for the same areas of the city in the composition of their narratives.

The structure of the literary space was studied using the kernel method for generating a density map that contains all the places in all of the novels and another with the same information separated by periods. The result is presented in the form of number of points per square kilometer.

The dimension of the literary space was studied from maps of areas generated for each of the novels by calculating the minimum convex polygon (MCP) using 95 percent of the points of each shape. This method was suggested by studies on animal ecology and the so-called home range, defined by William Henry Burt (1943: 351) as “that area traversed by the individual in its normal activities of food gathering, mating, and caring for young.”

This study takes on each of the literary works as an individual under observation, and the locations mentioned become places explored in potentially exploitable areas in Lisbon. Although some locations outside the city were mentioned in the novels, they were not considered for this purpose. As in the home range definition quoted above, the intention was to highlight the space that characterizes (and differentiates) each work, thus corresponding to the spaces in the narrative that are elaborated with greater frequency. In this context, the literary space of each sample was calculated by eliminating 5 percent of the peripheral points, excluding the area of marginal or occasional use, as shown in the example from the novel *A Capital!* (1929), by Eça de Queirós (figure 2). Locations excluded from the MCP at 95 percent are leisure, passage, or transgression places relevant for studying the significance of the places mentioned but not pertinent for analyzing literary space.

To evaluate the hypothesis of independence between space and time, the Spearman correlation was used to evaluate the evolution of the size of the area of each novel according to the period. The home range of each novel was then combined in the chronological periods to obtain “cumulative literary space” (represented in a sample of works) and “common literary space” (shared among a sample of works).



Figure 2 Literary space of *A Capital!*, by Eça de Queirós, calculated by the MCP 100 percent and 95 percent

Temporal Changes of Literary Space: Location and Structure

From the 35 novels, 610 locations were identified: 480 in the first ring (79 percent), 111 in the second (18 percent), and 19 in the third (3 percent) (figure 3). By calculating the ANN in the entire selection, an aggregate distribution throughout the study area can be identified. Analysis of the distribution by rings illustrates that the same pattern can only be found for the oldest area of the city (first ring), with statistically significant clusters (table 2). Corresponding to the more recently urbanized city (second and third rings), the number of locations specified in the literary corpus is lower, and its distribution presents a significant degree of randomness (third ring).

The higher concentration of locations in the first ring suggests that the literary space in the whole selection corresponds, to a large extent, to the area profusely and historically occupied. Despite the concentration along the waterfront and the main routes, locations reveal themselves as random in the second ring. However, in areas that were unurbanized or sparsely occu-

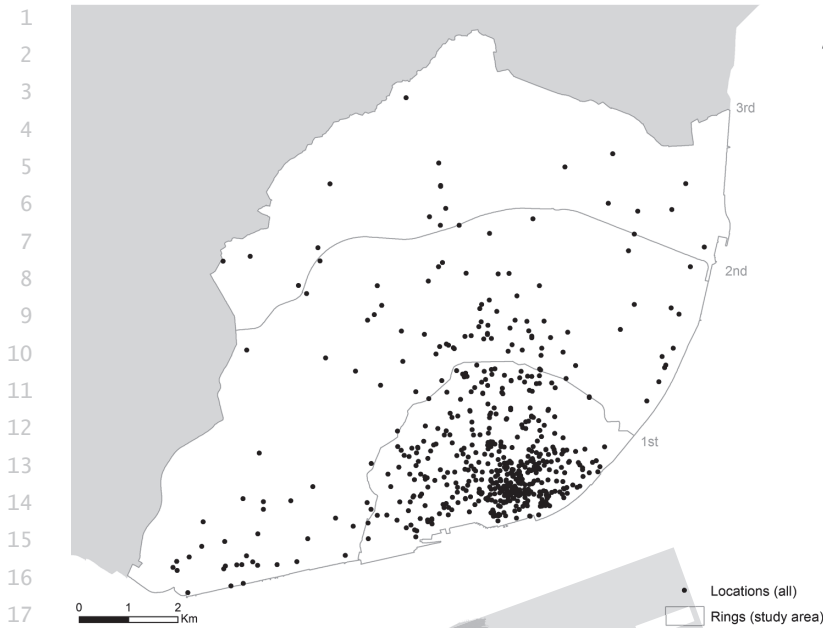


Figure 3 Locations in Lisbon municipality from the 35 novels by rings

Table 2 Average nearest neighborhood of locations by rings

Rings	ANN ratio	<i>p</i> -value	Study area (km ²)
1st ring	0.818073	< .01	13.59
2nd ring	1.003653	> .10	43.90
3rd ring	1.099638	> .10	27.14
All	0.661939	< .01	84.62

pied, locations were rare. In the third ring, locations were few. In the literary corpus used, parks, transition areas, and recent neighborhoods used for farming and gardening during a significant part of the time range studied were either underrepresented or not represented at all.

The kernel density index of locations identifies preferential areas of the literary space (figure 4). Areas spotted with rates of over 45 locations per square kilometer are those that caught the writer's attention. They are almost all inside the first ring. Rates between 45 and 90 locations per square

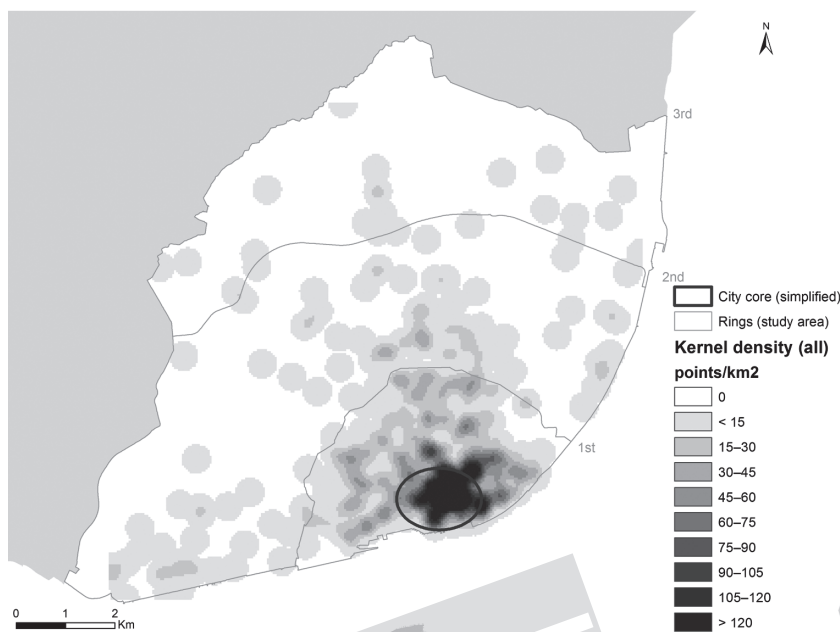


Figure 4 The kernel density index of all locations from the 35 novels

Table 3 Locations from the 35 novels by rings and time periods

Time periods	1st ring		2nd ring		3rd ring		All
	N	%	N	%	N	%	
1st	225	86.5	31	11.9	4	1.5	260
2nd	197	87.9	22	9.8	5	2.2	224
3rd	192	79.3	43	17.8	7	2.9	242
4th	177	66.0	77	28.7	14	5.2	268

kilometer emerge in those areas that developed in the nineteenth century. The core of older neighborhoods shows rates of over 90 locations per square kilometer.

The statistical distribution obtained by ring analysis leads to the conclusion that space and time variables were not independent, thus reflecting an expansion of the literary space over the time range (table 3, chi-square = 103.9; p -value < .001). Locations in the first ring consistently appear in Lisbon's novels, although there is a tendency for this area to lose relevance over

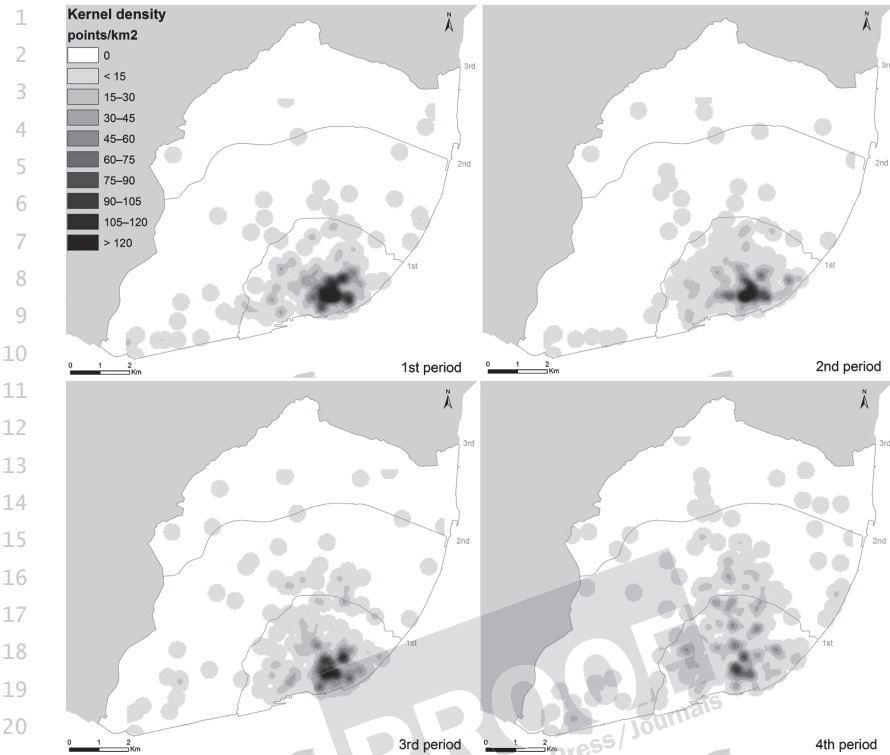


Figure 5 The kernel density index of locations from the first to the fourth periods

time. In addition, the second ring gains significant expression in the novels of the fourth period (28.7 percent), showing a literary representation that finally goes beyond the pre-twentieth-century neighborhoods.

The kernel density index of locations by time periods highlights changes in the literary space throughout the last two centuries (figure 5). From the first to the fourth time periods, there is a progressive fragmentation and a structural change in literary space. In the first period locations concentrated in a core area resulted in a central spot and other small blots around; in the following two periods this shade in the middle becomes infrequent although substantially located in the same area. Common to these three periods is the persistence of the literary space in the urban space built by the end of the nineteenth century.

Despite the centrality illustrated in the fourth time period (66 percent of the locations in the first ring), the kernel density index suggests the imple-

Table 4 Basic statistics of literary space size by novel

	Size (km ²)
Minimum	3.7
Maximum	54.9
Average	19.3
Standard deviation	12.7
Coefficient of variation	65.6%

sion of the core spots, generating several other small spots distributed in the first and second rings. Structural changes in the literary representation can be related to a certain devaluation of “the nineteenth-century city” as a reference.

Temporal Changes of Literary Space: Size

The novels’ literary space size (such as the home range of an individual) varies significantly between a minimum of 3.74 square kilometers (*Tuberculose Social* [1903], by Alfredo Gallis, from the first period) and a maximum of 54.9 square kilometers (*As Naus* [1988], by António Lobo Antunes, from the fourth period). This variation (65.6 percent) confirms the expected diversity of the sample and how Lisbon’s space is used in the several works. The average size is less than one-quarter of the municipality’s surface, which since 1886 has been practically equal to the current area (Alves 2005) (table 4).

The expansion of literary space over time is also found when testing the correlation between the literary space size and the time period variable. The value obtained for the Spearman rank coefficient ($r_s = 0.46898$; p -value $< .01$) revealed a statistically significant correlation, although weak, among the two variables. This result can be explained essentially by the fact that the novels of the first and fourth time periods are on the extreme scale of literary space size. However, the two intermediate periods have different trends, with the second period closer to the fourth and the third closer to the first (figure 6).

Figure 7 shows the size and location of the cumulative literary space and the common literary space from the 35 novels by the MCP 95 percent application (which excludes only seven peripheral locations, corresponding to 1.1 percent of the total). Cumulative literary space equals 0.85 square kilometer

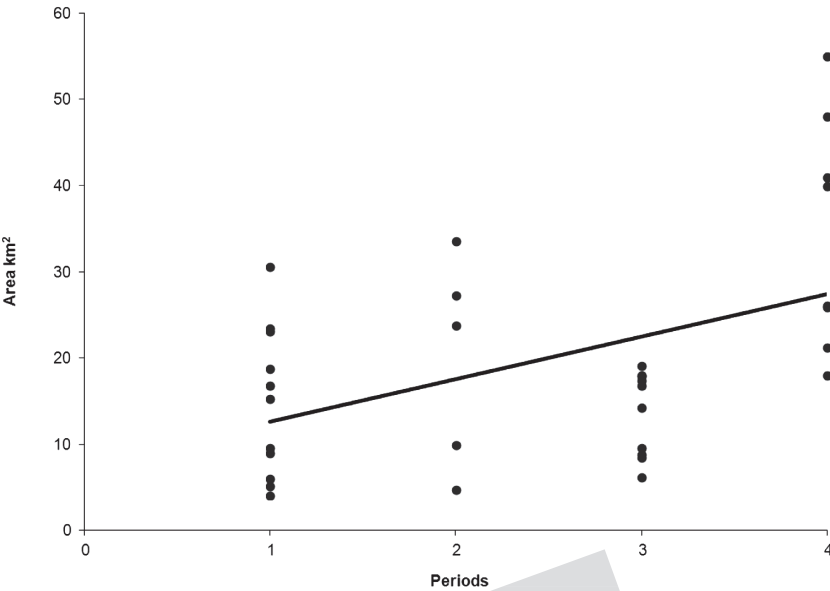


Figure 6 Literary space size for each novel throughout time with trend line

(1.4 percent of the cumulative literary space and 1.0 percent of the municipality's surface [table 5]).

Table 5 and figure 8 show the cumulative literary space and common literary space throughout time, and the trend is very similar to that found in the previous analysis of literary space by novels and time periods. The common literary space is very restricted in the first and third time periods and expands in the second and, notoriously, in the fourth. In the last time period common literary space noticeably exceeds the first ring. The cumulative literary space evolves differently, decreasing in one century and then expanding in the recent time period, covering the whole area of the second ring and part of the third ring. Once again, a certain similarity in the literary space of the first and third periods shows a relatively close configuration: concentration in the first ring with extensions toward the northern part of the city (more clearly during the first period) but also along the waterfront, somehow highlighting the line of the Tagus River as a whole.

The analysis of common versus cumulative literary space reveals the similarity of this parameter among the novels from the same time period.



Figure 7 Cumulative literary space and common literary space from the 35 novels

Table 5 Size of the cumulative literary space and common literary space by time periods

Time periods	Median area	Cumulative		Common		Common/ cumulative %
		Km ²	% of municipality area	Km ²	% of municipality area	
1st	12.42	45.16	53.4	1.02	1.2	2.3
2nd	23.72	43.13	51.0	4.65	5.5	10.8
3rd	15.50	31.80	37.6	2.71	3.2	8.5
4th	25.99	59.66	70.5	11.91	14.1	20.0
All	17.90	61.08	72.2	0.85	1.0	1.4

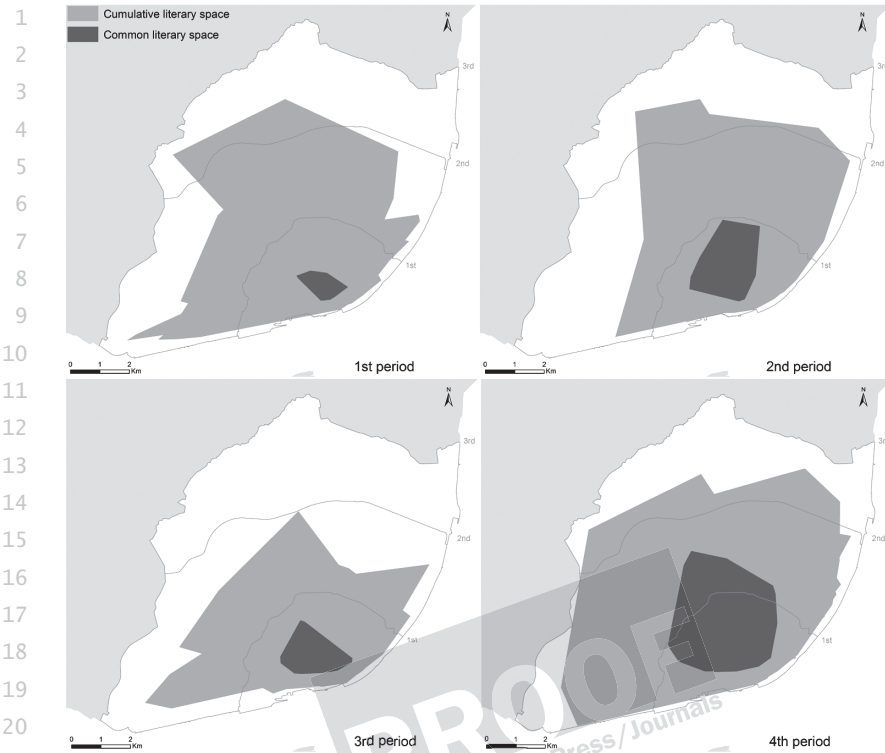


Figure 8 Cumulative literary space and common literary space from the first to the fourth periods

In this context, writings from the fourth time period are the most similar: despite the fact that its cumulative literary space is less than double the others, the common literary space is 12, 3, and 4 times higher than those calculated to the first, second, and third periods, respectively. Instead, writings from the first period differ mostly among each other in terms of their literary spaces. It suggests that writers from that time got inspiration from distinctive, small zones or represented increasingly fewer overlapping geographic areas. Novels are focused on the city core or on close neighborhoods, and, as a rule, they reflect low mobility. Contemporary writers open literary space to the whole territory of Lisbon without omitting the city center, if sometimes only as a hinge for large movements and fleeting passages.

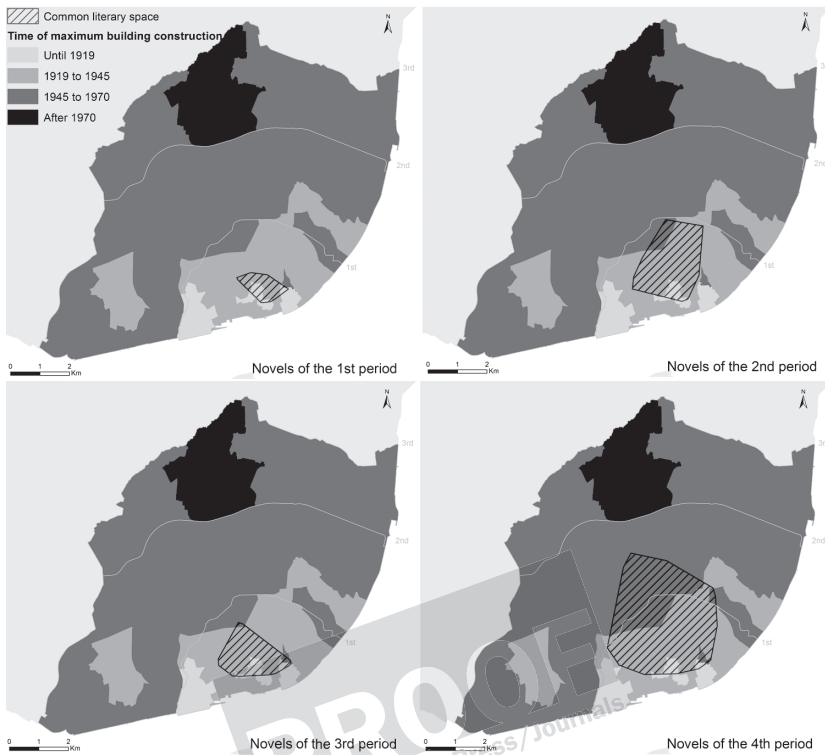


Figure 9 The coevolution of common literary space and building construction

Lisbon Imaginary versus Urban History

Unlike texts, literary space maps can be directly compared with other thematic maps on urban history that are in the same georeferencing system. Different juxtapositions generate a dynamic spatial narrative on the imagined territory, which suggests an exploratory research hypothesis for understanding urban social growth. Using official data for building construction and population density, partly used by Luís Espinha da Silveira et al. (2011) and José António Tenedório (2003), two examples demonstrate the potential of this framework.

Figures 9 and 10 show the common literary space in each period as constituted by urban consolidated areas. Outside are less urbanized zones with rural or periurban features. Beginning in the last quarter of the nineteenth



Figure 10 The coevolution of common literary space and population density

century, the city experienced a strong upward demographic trend, with the population increase lasting until the 1950s. Accompanying this trend, the city began to expand in two directions. One followed the river course, and the other expanded from the center to the north through a radial set of side roads that connected the urban core to surrounding rural areas. With housing construction, these roads that ran along the valleys became modern boulevards (see figure 1). At the same time, the city core was losing population, and the focus shifted to economic, political, and cultural facilities. Other areas farther from the center became residential. This trend accelerated in the second half of the twentieth century (Ferreira 1987; Rodrigues 1995).

Common literary space does not incorporate synchronously the trend of territorial occupation and local population growth. This is notorious in the maps of the third and fourth periods. Instead, it shows up attained to “the nineteenth-century city,” which persists as a reference in literature despite

the reduced dynamism in terms of people homing. We suppose it is due to the fact that for a long period of time “the nineteenth-century city” was the main center of economic and cultural life: signs and meanings emerge from a prolonged social experience. Although for a long time administratively included in the territory of the city, the recently urbanized areas do not have the same practice. They could be called “nonplaces,” according to the concept developed by Marc Augé (1995). They are empty of any historical, social, or experiential memory and, because of these characteristics, are absent in Lisbon’s imaginary.

In the last decades of the twentieth century, the modern city became attractive for its housing, commerce, and leisure. Changes in urban mobility during the previous decades also boosted the everyday use of wider territories, and literature seems to follow this trend.

Thus the polygons corresponding to the common literary space seem to reflect a time lag of three or four decades between settlement and the achievement of higher levels of functional urbanity. In this time range gardens, churches, theaters, schools, cafés, shops, sports facilities, and other public spaces were built and portrayed in the novels. They reflect the continuing construction of a complex social space that is a relevant element of urban history. Examination of the historical record locates the hot spots of social, cultural, and political experiences for each period as well as the city’s spots less crucial to the geography of the historical events. In addition to size and locations under review, we found many descriptions and details of characterization for future research.

As a product of the writers’ perceptions, these maps of imaginary geography capture the images of “territories of meaning” (Holt-Jensen 2009: 20–22, 227) or, according to Helen Couclelis (1992: 231), the “experiential space.” Pierre Bourdieu (2002: 160) states that “in a hierarchical society there is no space that does not become hierarchised and also no space that does not embody hierarchies and social intervals/distances” (quoted in Hess-Lüttich 2012: 4). In the specific case of Lisbon, the common literary space should correspond to the expansion of the “city of the blessed” and the city of “sociability” (Rosas 2010: 35) or, according to Lefèbvre (1991: 57), to the “space of the bourgeoisie and of capitalism,” from which writers mainly come.

Conclusion

Examining a large amount of literary material corresponding to a long time range, this study of urban space and its literary representation takes advantage of the functionality of GIS, its visualization capabilities, and the spatial-statistical techniques developed to analyze features commonly used in other fields and disciplines (e.g., animal ecology). Home range is adapted here to obtain new insights into literary space as a component of urban landscapes.

We propose a methodology that goes beyond the study of its location, defined by isolated points (e.g., Moretti 1998) or its location and structure, evidenced by spots from density analysis (e.g., Cooper and Gregory 2011). Converting literary locations into polygons—the better shape for representing space—and developing concepts of literary space, “cumulative literary space,” and “common literary space,” we introduce size calculations in addition to previous elements. In a comparative or evolutionary perspective, these polygons enable sequential and overlapping visualizations and can be combined with data from different origins and natures if spatially referenced in the same support.

This methodology could be seen as an updated operative consequence of “spatial turn” to literary studies. It also has the advantage of presenting these results in a fully replicable way that is comparable in a different corpus or geography. The article shows that the methodological approach for characterizing space in the novels is useful and appropriate for historical research on how city boundaries shaped visions of the urban space as it was lived and experienced.

The sections above present the results of a methodological approach that explore the Lisbon literary imagination. They reveal and therefore confirm literature as a potential material for urban contemporary history. They show that the literary space does not match the urban space and that there is a time lag for embedding it in the imagined literary scenario. We found a small core area corresponding to a part of the city center that persists as literary space in all the novels analyzed. Besides that, the peripheral areas of Lisbon were absent or underrepresented until 1974, even though their inclusion in the city limits dates back to 1886 and they were heavily urbanized in the 1950s and 1960s. The literary space that has proved plural and dynamic since the mid-nineteenth century to the present, because it goes beyond a book, an author, or a chronological period, tells “the history of space becoming place” (Buell 2005: 63).

Note

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